Lat 41.79359 Lon -122.6922 88-31

United States Department Of Agriculture | Forest Service | Shasta-Trinity National Forests

OK

Reply To: 3420 Date: August 19, 1988

Subject: Evaluation of Tree Mortality on Oak Knoll R.D., Klamath N.F.

To: Forest Supervisor, Klamath N.F.

Bill Van Vliet from the Oak Knoll R.D. noticed a general increase in tree mortality on the District. He requested an evaluation of the causes of the mortality to learn if there were any specific actions which could prevent further mortality. Dave Schultz and Gregg DeNitto from the Northern Forest Pest Management Service Area examined a number of situations on August 16, 1988. They were accompanied by Bill Van Vliet, Ken Harris and Tim Thompson.

West of Hawkinsville on the Humbug Road there were some Douglas-fir with considerable branch flagging. Site quality was fairly low. Much of the site was occupied by oaks and brush with some scattered old Douglas-fir. It also appeared to be a normally dry site with rabbitbrush, yerba santa, mountain mahogany and juniper being common. The past two years of dry winter weather have increased the degree of water stress on the site. This has allowed some insects which are normally restricted to severely suppressed or injured trees to be quite successful. The lower boles of the trees examined were heavily infested by the fir flatheaded borer, Melanophila drummondi. The upper branches probably also contained the Douglas-fir engraver, Scolytus unispinosus, and the Douglas-fir reproduction weevil, Cylindrocopturus furnissi.

Douglas-fir engraver adults have to bore into the cambium to lay eggs. Adult weevils chew small holes through the bark into the cambium and insert eggs. In the case of both these insects, if the host is vigorous and has high resin pressure, either the adults would be repelled by the resin flow or larvae may be killed. Adult flatheaded borers simply lay eggs in bark crevices of host trees. After the eggs hatch, the larvae must bore through the bark to reach the cambium. If the host is vigorous, it will kill the larvae, but if the host is declining, the larvae will survive. Flatheaded borer larvae can survive from 1 to more than 4 years in a host tree and they contribute to the host's decline in vigor as they complete their life cycle. All of the beetles detected would be much less successful if there were more precipitation or if the stress on the trees could be reduced. On the lower quality sites it would probably not be feasible to reduce the amount of brush or thin based only on the timber value, but these projects may have merit if they also benefit range or wildlife resources. It is doubtful if any actions at this time could benefit the remaining live trees. Rather, management activities which disturb the site could add additional stress during this drought period and further increase mortality.

A second area examined was north of Humbug Creek in the old Haystack Burn. Douglas-fir seedlings and saplings were dying along a small ridge on a

south-facing slope. The soil was extremely rocky and appeared as if it might have been graded or severely compacted. Growing conditions were so poor in some areas that even brush and grass had not invaded the site. On many of the affected trees there was a canker centered around a branch which had died. In other areas of northern California, a fungus, Phomopsis lokoyae, has been identified with similar cankers. Historically, the incidence of this canker increases during drought periods. In some cases the Douglas-fir engraver had taken advantage of the tissues infected by the canker fungus for use as breeding material. Both the canker fungus and the engraver tend to be more successful in slow growing or stressed trees. It appeared that both had been contributing to seedling and sapling mortality on this site for a number of years, which reflects the general harshness of the site. It also appeared that mortality had increased in the past year or two, which reflects the low amount of precipitation received. Much of the branch flagging of Douglas-fir observed on other parts of the District also involved these two organisms.

There doesn't seem to be any practical action which could be taken on this particular site to increase the vigor of the remaining trees and reduce losses to these opportunistic feeders. However, both the canker fungus and Douglas-fir engraver occur almost everywhere in northern California where Douglas-fir grows. In commercial-quality stands of young Douglas-fir, reduction of competition due to brush or overstocking will reduce losses to these organisms.

A third area examined was a plantation in the Buckhorn Burn north of Horse Creek. The plantation was currently being thinned and there was some concern that because the trees were already under stress from two years of low precipitation, the added disturbance from thinning could provoke an outbreak of some type of pest. In most places the plantation contained a mixture of Douglas-fir, ponderosa pine and sugar pine. All trees were less than ten years old and ranged from 3 to 8 feet in height. In general, the trees had not closed crowns yet. There was abundant grass but little or no brush. During the thinning operation, all slash was being lopped and bucked. There appeared to be no major problems, with the exception that white pine blister rust, Cronartium ribicola, was quite common on the sugar pine.

This thinning operation should not cause any additional problems because the plantation is already fairly healthy, the manual chainsaw thinning will create little disturbance to the leave trees, and there should be little opportunity for pine engravers, Ips spp., to build in the slash because of the small size of the material, timing of the thinning, and slash treatment. The types of thinnings which could create problems during drought periods would include entering stands which already have complete crown closure or are severely overstocked, the use of rotary masticators or similar heavy machinery, and partial cuts in older stands which would tend to leave larger diameter slash.

If you have any questions about this evaluation, please call Dave Schultz or Gregg DeNitto at 916-246-5087.

/s/

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